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USE OF AUTOGENIC TRAINING BY PARATROOPERS IN PREPARATION FOR AND EXECUTION OF PARACHUTE JUMPS

The author defines challenging aspects of enhancing emotional stability of paratroopers for parajumping execution. Psychological factors and professional activity features of servicemen of aero-mobile troops are also described. Methods of autogenic training, which are used during airborne preparation, are adapted to conditions of their operation. The results of empiric research of autogenic training use by paratroopers are presented.

The core element of professional activity of servicemen of aero-mobile troops is preparation for and execution of parachute jumps. They are associated with the impact of various stress factors on the human organism, the key ones being psychological: a permanent element of risk and threat to life; necessity to operate under specific conditions; lack of information when on board a plane and during a jump; restricted time for implementation of necessary actions; movement in support-free space; expectation of dynamic shock at parachute opening and landing. They create a considerable load on the emotional sphere of paratroopers, which results in less successful performance or even professional activity failure (L. P. Grymak, 1971; D. D. Scherman, 1976; A. V. Barabanschikov, M. A. Belousov, V. V. Sysoev, 1982; B. V. Endal'cev, V. I. Kopanev, 1992; O. A. Blinov, 1998, 2007).

The traditional ways of building up readiness in the course of training and parajumping as of today are practically exhausted. Higher requirements to the quality of ground airborne preparation, technology of safe parajumping, as well as individual psychological characteristics of servicemen that later on are getting worse, necessitate new approaches to this problem solution (G. D. Temko, M. I. Tomchuk, 1996; G. A. Gaydukevich, G. V. Lozhkin, S. V. Semin, 1997).

Therefore a perspective direction of research is the study of building up emotional stability of paratroopers during airborne preparation based on their use of methods of autogenic training, which proved to be successful in sport psychology, medicine, military and aviation psychology (B. A. Vyatkin, 1981; A. P. Kozin, 1985; V. S. Lobzin, M. M. Reshetnikov, 1986; L. P. Grimak, 1991; V. M. Zvonnikov, A. V. Shakula, 1993), as well as in the activity of specialists of other categories who work under extreme conditions (M. S. Korol'chuk, 1996; P. P. Krivoruchko, 1998; O. A. Blinov, 2009).

The results of psychological research of features of building up emotional stability of 18-19 year-old servicemen, making their first parachute jump, have been used as the material for the work completion.

At all performance stages the features of paratroopers' emotional stability (totally 133 servicemen) were discovered by using a set of methods which included: subjective evaluation – by the "SAM"/(State-Activity-Mood) method (V. A. Doskin et al., 1973); evaluation of heart rate frequency (V. P. Zagryadskiy, Z. K. Sulimo-Samuylo, 1976); level of emotional stability, responsiveness and individual anxiety; the level of neuropsychic stability was found out with the help of questionnaires developed by H. Eysenck, Ch. Spilberg-Khanin, V. A. Bodrov and Lüsher's eight-colour test (V. L. Maryschuk et al., 1990); the building up experiment was conducted making use of special autogenic training methods (M. S. Korol'chuk, M. V. Kornienko, 1991).

For evaluation of paratroopers' emotional stability we employed direct indicators – individual evaluations that characterized successful preparation and execution of a parachute jump. The

evaluation of servicemen professional operation success was made by direct indicators using the four-point scale in compliance with the requirements of the "Method guide on the organization and monitoring of airborne preparation".

The analysis of the results obtained showed that the use of autogenic training methods by paratroopers during airborne preparation had substantially influenced the success of the experimental group servicemen performance.

The analysis of dynamics results of successful operation of emotionally stable servicemen of both control and experimental groups over inspection periods shows that the results of the experimental group servicemen are 12-16% higher than similar figures of the test group servicemen. The success of performance of emotionally unstable experimental group parachutists compared to the success of performance of the emotionally unstable test group parachutists is by 17-28% higher ($P<0.05$).

Parachute simulator training has proved that the success of performance of emotionally stable parachutists of the experimental group exceeds by 19% the figure for emotionally unstable parachutists, in parachute tower jumping – by 21%, and during execution of parachute jumps – by 30% ($P<0.05$).

To find out the dynamics of side indicators of emotional stability for the experimental group paratroopers, its features were studied under the conditions of airborne preparation. It was discovered that due to parachute simulator training completion as compared to the test group the level of how one feels is by 0.73 points higher, the activity level – by 0.42 points, mood – by 0.6 points, general evaluation of subjective state rises by 10% ($P<0.05$).

General evaluation of subjective state of the experimental group paratroopers on the take off area makes up 6.3 points, in flight on board an airplane – 5.94 points (exceeds the level of the test group by 6%), on the landing area after parachute jump completion – 6.95 points (exceeds the figure of the test group by 10%).

For the experimental group servicemen the highest heart rate frequency (HRF) over the research periods was discovered on the parachute tower top floor prior to jump execution and equals 118.33 bps (beats per second). It is 19% higher than the value of HRF during parachute simulator training and 14% higher than the HRF of paratroopers on board an airplane.

The comparative analysis of HRF levels for the servicemen of both test and experimental groups shows that for servicemen who utilized autogenic training, the HRF level during parachute simulator training is by 8% lower, during parachute tower jump execution – by 13%, and during parachute jumps execution – by 16%.

In the experimental group the level of situational anxiety revealed prior to jump execution from a parachute tower is equal to 42.15 points. Before commencement of parachute simulator training and parachute jumps execution it is 5-15% higher respectively, which we consider to be an adequate response to the use of autogenic training by paratroopers.

At the same time it was discovered that over the operating periods situational anxiety for the experimental group servicemen compared to the test group is 13-22% less, which testifies to the effectiveness of the measures proposed.

The analysis of indicators of individual anxiety of the experimental group paratroopers points to the emergence of its highest level prior to parachute tower jump execution and makes up 32.21 points. It exceeds the level of individual anxiety for parachutists before commencement of parachute simulator training by 4% and before commencement of parachute jumps execution – by 2%.

The level of individual anxiety revealed in the experimental group servicemen is 1-3% less than that of the test group, which testifies to its stability as a result of paratroopers performance.

Application of Lüscher's test results identified relevant levels of psychic tension, capacity for work, self-regulation. Thus, for the experimental group servicemen the dynamics of psychic tension is characterized by more obvious decrease of its level as compared to the test group. It becomes less upon termination of parachute simulator training and after a parachute tower jump respectively by 5% and 7%, and after execution of a parachute jump – by 10%.

In the experimental group all levels of operating capacity over the research periods are exceeding and differ ($P<0.05$) with regard to the relevant levels in the test group: before commencement of parachute simulator training by 43%, upon its completion – by 44%; before commencement of a parachute tower jump by 32%, upon jump execution – by 31%; on the take off area prior to parajumping by 36%, and on parajumping completion – by 43%.

It was discovered that all self-regulation levels of the experimental group servicemen as distinct from those of the test group at doing exercise on a parachute simulator, during parachute tower jumps, as well as during parachute jump execution have better indicators and undoubtedly differ ($P<0.05$) from the results of the test group. Thus, prior to parachute tower jumping in the experimental group self-regulation level makes up 2.43 points, that is by 66% more than the relevant value of self-regulation for the test group.

On the day of parachute jumps execution in the experimental group the self-regulation level of paratroopers on the take off area is 2.27 points, and it is 1.5 times higher than the relevant figure for the test group.

Based on the study of direct and side indicators of emotional stability of the experimental group paratroopers during preparation for and execution of parachute jumps a 10-14 day decrease of their preparation time for parachute jumps execution due to autogenic training application was found out.

Thus, a substantial improvement of results characterizing emotional stability of the experimental group paratroopers as compared to the test group in the periods of airborne preparation testifies to the positive effect of autogenic training.

In order to find out connection between performance success indicators of paratroopers and side indicators we have conducted a correlation analysis. An obvious connection ($P<0.05$) was found between the parameters of paratroopers successful performance during all periods of airborne preparation and their neuropsychic stability, the way they feel, activity, mood, situational and individual anxiety, heart rate frequency, as well as Lüscher's test results.

With the purpose of in-depth study of side and direct parameters connection of the experimental group servicemen performance the factor analysis was conducted making use of the principal component method (K. Pearson).

The factor analysis showed that the most informative indicators of determining the effectiveness of building up emotional stability based on the use of autogenic training by paratroopers appear to be neurotism and neuropsychic stability (0.91-0.92), situational (0.7) and individual anxiety (0.64), eight-colour Lüscher's test results - self-regulation (0.63), psychic tension (0.72), capacity for work (0.71), as well as HRF (0.52) and "SAM" (0.56).

SUMMARY

1. Based on available literature data and professional experience, preparation for and execution of a parachute jump are connected with the effect of various stress factors on the human organism, the key ones being psychological: threat to life, necessity to operate in uncommon conditions of air space, permanent deficit of information when on board an airplane and during a jump, restricted time for implementation of necessary actions, expectation of dynamic shock at parachute jump execution and landing shock. If individual psychological features of servicemen are not taken into account in preparation for parajumping, it will result in a substantial decrease of emotional stability and giving up of further professional activity.

2. Building up of paratroopers' emotional stability is carried out on the basis of preliminary autogenic training which includes preparatory, relaxing-adjusting and active mobilizing periods, which allows to enhance emotional stability of paratroopers prior to and after parachute jump execution. Use of autogenic training by emotionally stable servicemen of the experimental group enabled to improve their performance during airborne preparation up to 16%. The most considerable changes were observed to occur with the emotionally unstable servicemen of the experimental group, who demonstrated an increase of performance by 17-28%. Application of

autogenic training by paratroopers allows for 10-14 day reduction of their preparation time for parajumping.

3. For an early exposure and correction of paratroopers' low emotional stability during airborne preparation the following individual features and states are recommended to be studied: neurotism, neuron-psychic instability, individual and situational anxiety, subjective state, frequency of heart rate which by the correlation and factor analyses proved to be obviously connected with emotional stability. Per se the level of emotional stability is determined by the methods developed by: H. Eysenck, Ch. Spilberg-Khanin, V. A. Bodrov, SAM, HRF, eight-colour Lüscher's test results, as well as paratroopers' performance success.

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